**Gustatory System and Gustation (Molitor): Worksheet**

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1. **Describe the organization of the gustatory system**
2. Taste perception mediated by three different CNs
3. Ipsilateral projection to nucleus of solitary tract (NTS) in brainstem

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| ***CN*** | ***Origin*** | ***Ipsilateral Projection to NTS*** |
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1. Reciprocal connections between NTS, hypothalamus, and amygdala
   1. Responsible for affective responses to taste, modulation of taste
2. *Ipsilateral* and *contralateral* projections to ventral posteromedial thalamus (VPM) and gustatory cortices
   1. Traditionally viewed as ipsilateral
3. **Describe the relationships between taste, appetite, and visceral responses**

***Strong relationship between appetite and taste***

* Pleasant tastes \_\_\_\_\_\_\_\_\_\_\_ appetite, unpleasant tastes \_\_\_\_\_\_\_\_\_\_ appetite
* Hunger can enhance taste and other visceral sensations

***Relationship between taste and other visceral sensations***

* Extremely unpleasant tastes can initiate \_\_\_\_\_\_\_\_\_\_ and/or \_\_\_\_\_\_\_\_\_\_\_

1. **Describe taste bud structure and tastant transduction**

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| **Papillae** | **% Of Taste Buds** | **Description** | **Location on Tongue** | **Taste Receptors Project To** |
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| ***Classification of Tastants*** | | |
| Tastant | Examples | Threshold |
| Sweet |  | Sucrose: \_\_\_\_ mM |
| Umami |  | MSG: \_\_\_\_ mM |
| Salty |  | NaCl: \_\_\_\_ mM |
| Sour |  | Acid: pH \_\_ ( \_\_\_ μM of H+) |
| Bitter |  | Quinine: \_\_\_\_ μM |

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| ***Tastant Transduction*** | | | | |
| **Direct gating or permeation of ion channels** | | **GPCR mediated responses** | | |
| *Salty* | *Sour (acids)* | *Sweet* | *Umami* | *Bitter* |
| \_\_\_\_\_\_\_\_\_ sensitive \_\_\_+ channel | \_\_\_+ sensitive \_\_\_\_ channel | T1R2/T1R3 | T1R1/T1R3 | T2R |
| Depolarization of taste cell (circle one): directly/indirectly | | * + 1. GPCR activates \_\_\_\_\_\_\_\_\_\_ that activates \_\_\_\_\_     2. \_\_\_\_ produces \_\_\_\_\_\_     3. \_\_\_\_\_ gates TRPM5 Ca2+ channel and \_\_\_\_\_ release from intracellular stores     4. \_\_\_\_\_\_ influx 🡪 NT release (e.g. \_\_\_\_\_\_) | | |

1. **Describe the organization and responses of the trigeminal chemosensory system**

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| ***Trigeminal Chemoreception*** | | | |
| **Nociceptive Afferents** | **Irritants** | **Relay Centers** | **Reflexes** |
| CN V  CN IX  CN X | NH3  Ethanol  Acetic Acid  CO2  Methanol  Capsaicin | Spinal trigeminal nucleus  Ventral posteromedial (VPM) thalamus | Salivation  Perspiration  Tearing  Nasal secretion  Respiratory Responses |

1. **Understand the etiology of taste disorders**

List 5 examples of Aguesia